2010 INTERNATIONAL WORKSHOP ON ENVIRONMENT AND ENERGY

Environmental Projects for Aerospace Applications

AMRDEC
STRENGTH THROUGH TECHNOLOGY

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

2 November 2010

Presented by:

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Chemical Depainting for Missile and Aviation Systems

Chemical Depainting for Missile and Aviation Systems

Requirement/Impact Statement

- Sustainment of aviation and missile weapon system maintenance activities require the use of HAP-free chemical paint strippers.
- Identify and evaluate potential replacements for methylene chloride based strippers.
- This program is evaluating immersion and manual paint strippers that are NESHAP compliant.

2024-T3
MIL-C-5541 Type I, Class 1a
Stripping Efficiency Panel

Description

- This program is being conducted in two phases:
  - Screening phase which includes performance and hydrogen embrittlement testing
  - Materials compatibility testing phase
- Funded under Sustainable Painting Operations for the Total Army (SPOTA) and Corrosion Programs

Status Assessment

- Schedule:
  - Materials testing scheduled for completion June 2011 with final report completed September 2011
- Performance:
  - Screening tests are completed. This includes performance and hydrogen embrittlement testing.
  - Majority of test panels and all paint strippers have been sent to CTC for materials testing.
  - Materials testing has begun.

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Chemical Depainting for Missile and Aviation Systems Coatings

Topcoats

- 1. MIL-PRF-22750
- 2. MIL-DTL-64159 Type I
- 3. MIL-DTL-53039 Type II, Polymeric and Silica

Primers

- 1. MIL-PRF-53030 Type I and II
- 2. MIL-PRF-23377 Type I Class N
- 3. MIL-PRF-23377 Type I Class C
- 4. MIL-PRF-85582 Type I Class N
- 5. MIL-PRF-53022 Type I

Chemical Depainting for Missile and Aviation Systems Paint Strippers

Manual paint strippers

- 1. Crest Paint Stripper #210
- 2. EFS-2500
- 3. Ardrox 2865
- 4. Turco 6813ED
- 5. Turco 6881
- 6. D-Zolve 917 HV
- 7. D-Zolve GL 1220
- 8. Crest #7 control

Immersion paint strippers

- 1. EUROSTRIP 7028/7031
- 2. Ardrox 2320
- 3. Brulin Safety Strip 61 Special
- 4. D-Zolve 917
- 5. D-Zolve GL 15-33IM
- 6. Safety Strip 5896B Control

Chemical Depainting for Missile and Aviation Systems

- **Screening Phase**
  - **Laboratory testing performed by Concurrent Technologies Corporation in Largo, FL.**
  - **Performance**
    - **Determination of stripping efficiency**
      - 1” x 8” 2024-T3 alodine treated panels with various primers and topcoats
      - For immersion applications, panels were immersed for one hour.
      - For manual applications, panels were racked at a 60° angle and brushed with paint stripper along the top edge. Panels were exposed for 3 and 6 hours.
      - All panels were scraped, rinsed, evaluated, and the % primer and the % substrate revealed were determined.
  - **Hydrogen Embrittlement**
    - Type 1d, partial cadmium plated specimens were tested.
    - Test specimens were immersed for 150 hours.
    - Specimens were galvanically isolated from the test hardware.

Chemical Depainting for Missile and Aviation Systems

- **Extended Materials Compatibility Testing**
  - **Laboratory testing performed by Concurrent Technologies Corporation in Largo, FL.**
    - Testing in progress.
  - **Corrosion**
    - Intergranular Attack/End Grain Pitting
    - Panel Corrosion
    - Sandwich Corrosion
    - Dissimilar Metals
    - Elevated Temperature
    - Stress Corrosion
    - Total Immersion
  - **Storage Stability**
  - **Refinishing Properties of Stripped Surfaces**
  - **Hydrogen Embrittlement 1d**
  - **Condition in Container**
  - **Longevity**

Chemical Depainting for Missile and Aviation Systems Summary

- **Issues**
  - Screening phase originally included hydrogen embrittlement 1c testing. This testing was performed but the specimens were not galvanically isolated from the test fixture. Rather than repeat 1c testing, HE 1d testing was conducted. For this testing, nylon shoulder washers were used for isolation. This caused a short delay in screening results and materials testing.
  - Only two immersion and one manual paint stripper passed hydrogen embrittlement 1d testing. The remaining set of panels for materials compatibility testing will be used if needed for retesting.
  - Stress corrosion specimens were received flat and must be drawn to shape by an approved procedure prior to sending to CTC.

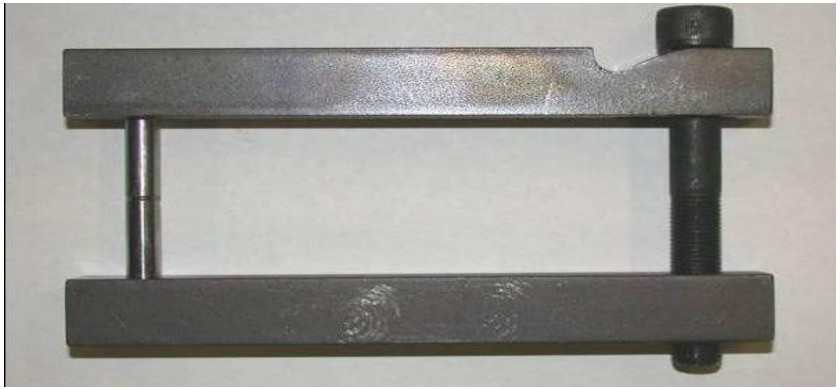
Major Accomplishments

- Completed Screening Phase.
- Down selected two immersion and one manual paint strippers for materials compatibility testing. Extended materials testing in progress.
  - Manual
    - Ardrox 2865
      - Best stripping performance of all alternatives, including Crest #7 control
      - Only manual stripper alternative that passed hydrogen embrittlement 1d testing
      - Benzyl Alcohol based
  - Immersion
    - DZolve GL 15-33
      - Third best immersion stripping efficiency and better than Brulin 5896 control
      - Passed HE 1d testing
    - Brulin Safety Strip 61
      - Fourth best immersion stripping efficiency and better than Brulin 5896 control
      - Passed HE 1d testing

Chemical Depainting for Missile and Aviation Systems Screening/Performance

Stripping Efficiency Testing

Chemical Depainting for Missile and Aviation Systems Screening/Hydrogen Embrittlement 1c



Tagnite Non-Destructive Inspection (NDI) Testing of Magnesium Transmission Housings for Aviation Systems

Tagnite Non-Destructive Inspection (NDI) Testing of Magnesium Transmission Housings for Aviation Systems

Requirement/Impact Statement

- Identification and implementation of improved procedures for depot and organizational level maintenance and eliminate the use of pretreatments containing hexavalent chromium on magnesium housings and obtain improved corrosion resistance over conventional processes.
- The impact will be DOD wide on all Tagnite/ Rockhard coated magnesium parts used in Aviation.
- Exit criteria will be Final Report recommending Tagnite coated magnesium processing procedures to Depots.

Description

- This will leverage the work done under NDCEE Task 473-A2 Stripping of Tagnite Housings.
- The technical approach will show proof of magnesium crack detection through coated magnesium components.
- Specific weapon systems applications will be on any weapon system using Tagnite/ Rockhard coated magnesium parts.
- Funded under the SPOTA Program.

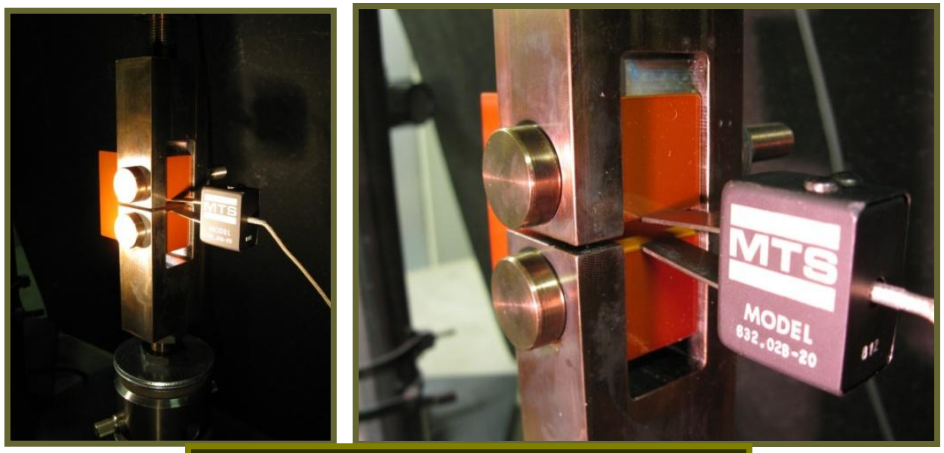
Status Assessment

- Schedule:
  - Hitting milestones – Yes.
  - Anticipated end/transition date – December 2010.
- Performance:
  - Achievements include completion of all required project testing.
  - Draft final report completed and out for review.
  - Likelihood of success – very good.

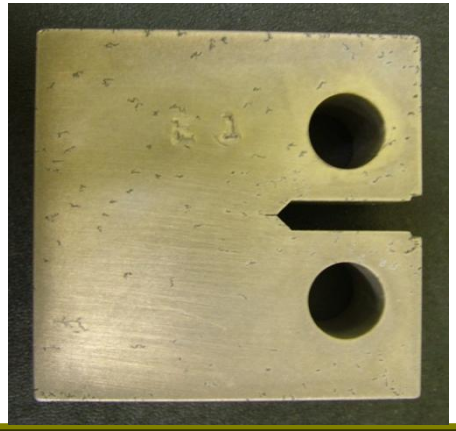
NDI Techniques for Tagnite/Rockhard/Alodine coated magnesium components evaluates NDI capabilities to determine if component flaws can be detected under coatings

- ZE 41A magnesium notched fracture toughness coupons purchased.
- Cracking Methodology Developed and Verified (via Photo-Micrograph) at AMRDEC.
- Coupons coated.
- Coupons cracked to 0.03” and some to 0.05”.
- Coupons NDI tested per ASTM E 1417, Type I, Level 3, Method D Swab Method followed by the Bleed Back Technique.
- Project testing has been completed.
- Draft final report has been completed.
- Draft final report out for review at AMRDEC and then Non Destructive Testing Center of Excellence(NDT CoE)

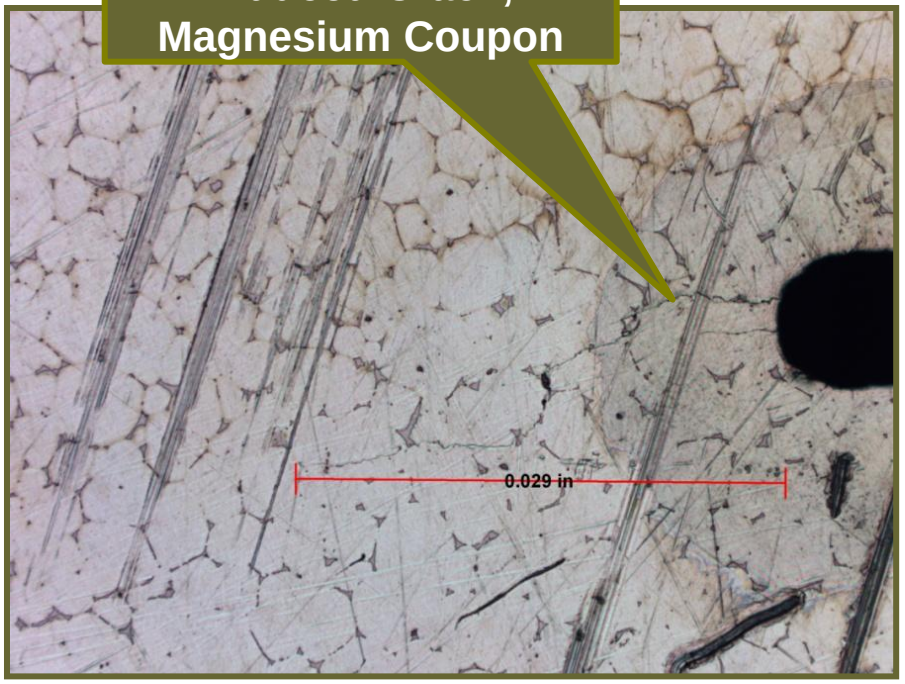
Tagnite Non-Destructive Inspection (NDI) Testing of Magnesium Transmission Housings for Aviation Systems



Instron Set Up



Fracture Toughness Coupon



Induced Crack, Magnesium Coupon

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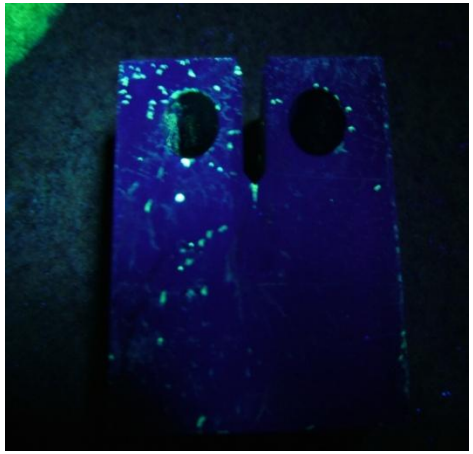
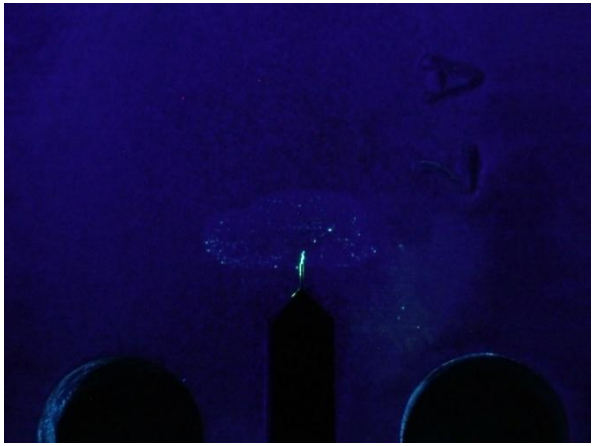
Preliminary Results for 0.03” Cracks

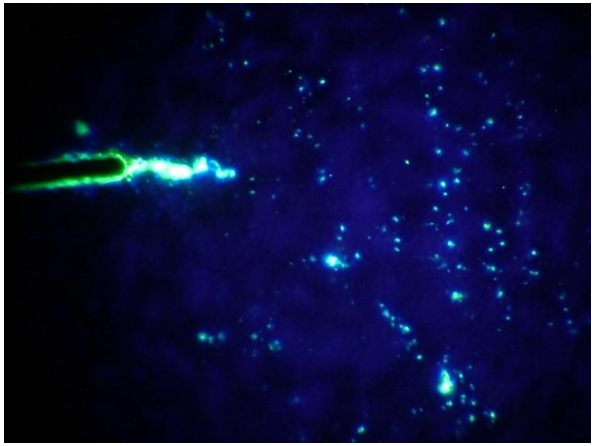
- **Bare Magnesium Coupons**
  - Surface pitting occurred during the FPI post inspection cleaning process.
  - Penetrant bleed out is adequate with some bleed out from pre crack-notch at 0X,10X.
  - Pre-crack notch is distinguishable from crack at 60X magnification.
  - Background fluorescence is acceptable.
  - Residual penetrant remains on the bare surface after post inspection cleaning which could have detrimental effects.



Surface Pitting



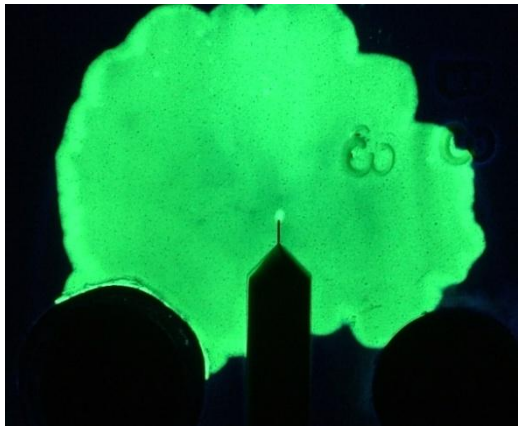
Residual Penetrant, 0X



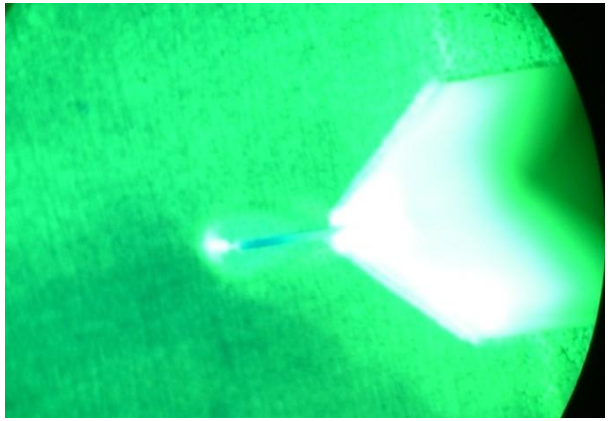
Notch and Crack, 60X

Preliminary Results for 0.03” Cracks

- **Tagnite 8200, Type I Anodize**
  - The coating porosity trapped the developer chemicals causing extreme, unacceptable background fluorescence.
  - Penetrant bleed out nearly undetectable at 0X,10X.
  - The distinction between the crack and the notch is possible at 60X using the bleed back technique.
  - The NDT CoE recommends that actual aircraft components with porous coatings comparable to Tagnite (only) should not be inspected with a Method D FPI process.



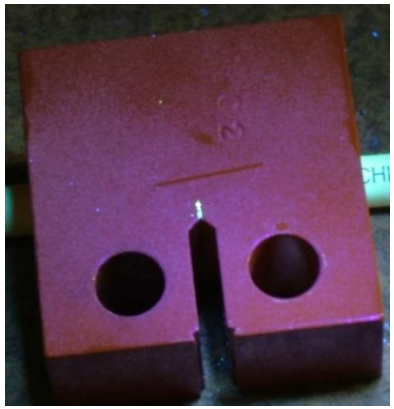
10X



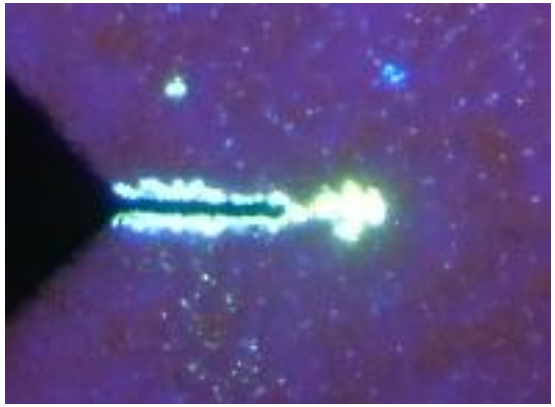
Notch and Crack at 60X, Bleed Back

Preliminary Results for 0.03” Cracks

- **Tagnite 8200, Type I Anodize/High Temp Rockhard**
  - Rockhard coating over Tagnite eliminates the surface porosity and absorption of developer chemicals.
  - Penetrant bleed out is adequate with some bleed out from pre-crack notch at 0X,10X.
  - Indication appears blotchy and could be misinterpreted as excess bleed out from pre-crack notch.
  - Pre-crack notch distinguishable from crack at 60X.
  - Background fluorescence is almost nonexistent providing very good contrast.



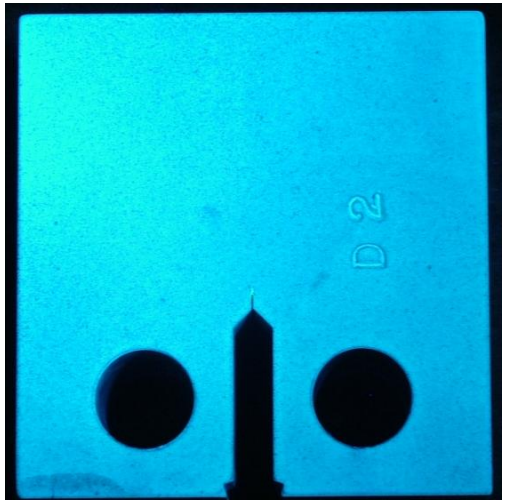
0X



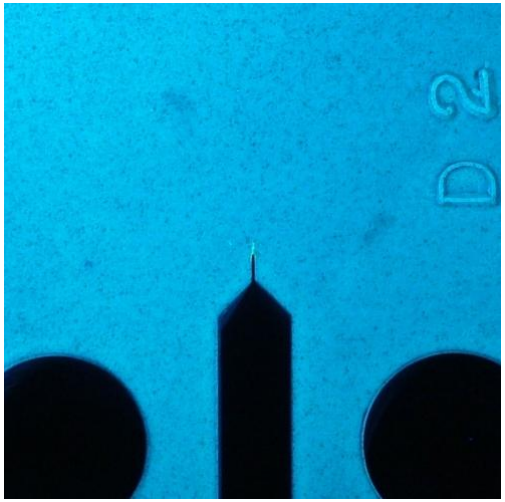
Notch and Crack at 60X

Preliminary Results for 0.03” Cracks

- **Brush Tagnite 12/Low Temp Rockhard 985**
  - Penetrant bleed out is adequate with minimal bleed out from pre-crack notch at 0X, 10X.
  - Pre-crack notch is easily distinguishable from crack at 10X.
  - Background fluorescence is almost nonexistent.
  - Coating surface is reflective, reducing contrast of penetrant indication.



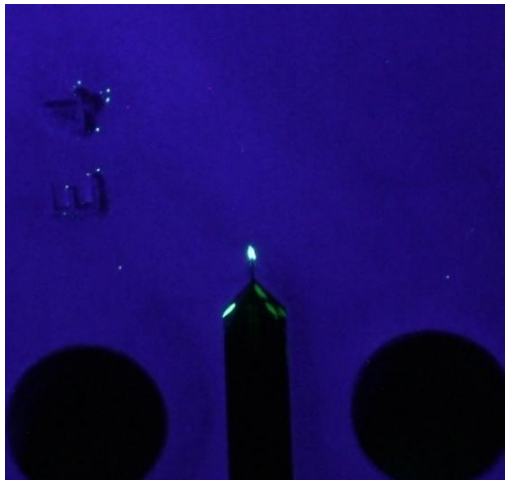
0X



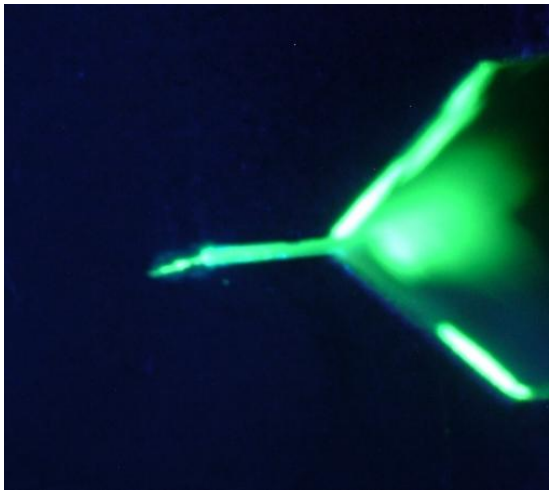
10X

Preliminary Results for 0.03” Cracks

- **Acid Bi-fluoride Pickle/Alodine 5700**
  - Penetrant bleed out is adequate with some bleed out from pre-crack notch at 0X, 10X.
  - Indication is blotchy and cannot distinguish notch from the crack.
  - At 30X using bleed back techniques, the crack is more distinctive.
  - Background fluorescence is minimal.



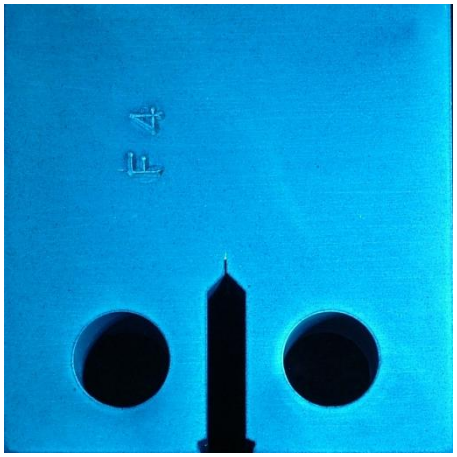
10X



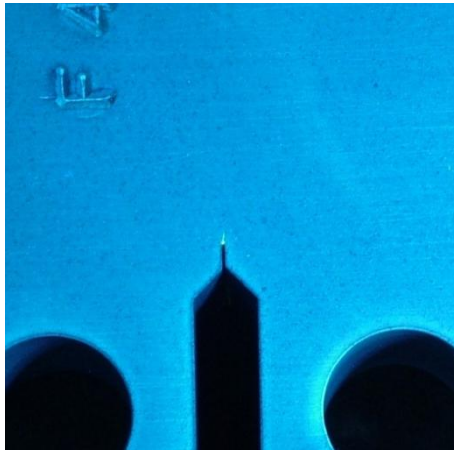
Bleed Back, 30X

Preliminary Results for 0.03” Cracks

- **Acid Bi-fluoride /Alodine T 5900/Low Temp Rockhard**
  - Penetrant bleed out is adequate with minimal bleed out from pre-crack notch at 0X,10X
  - Penetrant bleed out from the crack is easily separated from pre-crack notch bleed out at 10X.
  - Background fluorescence is almost nonexistent.
  - Coating surface is reflective, reducing contrast of penetrant indication



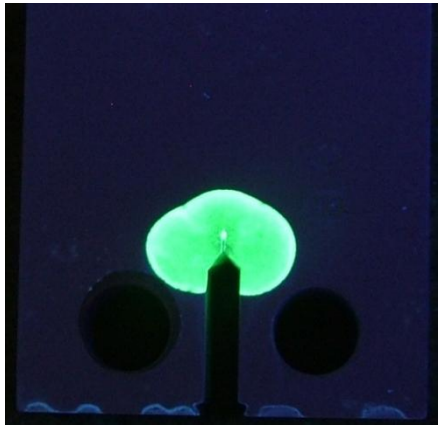
0X



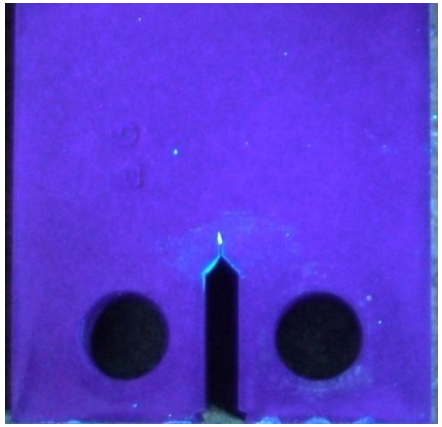
10X

Preliminary Results for 0.05” Cracks

- **Only Tagnite and Alodine 5700 panels were tested.**
  - Background fluorescence, penetrant bleed out, and bleed back results were predictable based on 0.03” testing.
  - For Tagnite only, the background fluorescence is unacceptable. For Alodine 5700, background fluorescence is minimal.
  - The 0.05” cracks were relatively easy to detect. The cracks extended beyond the pre-crack notch bleed out.



Tagnite only



Alodine 5700

Summary

- For this testing, the swab method is the preferred method to limit the amount of penetrant bleed out from pre-crack notch, followed by the bleed back method.
- For all Rockhard coated test coupons, detection of cracks was easier than for pretreated only coupons (Tagnite and Alodine 5700).
- The Rockhard surface appears to crack with the underlying magnesium substrate.
- For Tagnite only coupons, the porosity of the coating trapped the developer chemicals and the entire part fluoresced. The Alodine 5700 coating did not trap the developer chemicals.
- The cleaning procedure after NDI caused surface corrosion on Bare and Alodine 5700 coupons.

Tagnite Non-Destructive Inspection (NDI) Testing of Magnesium Transmission Housings for Aviation Systems Preliminary Results Summary (cont'd)

- For Bare and Alodine 5700 coupons with 0.03" cracks, NDT CoE recommends not using the dip method if cracks are expected in close relationship to tight geometrical features such as pre-crack notch.

- For Tagnite only with 0.03" cracks, NDT CoE recommends not using Method D FPI process on comparable coatings.

- For all Rockhard coated test coupons with 0.03" cracks, NDT CoE recommends against using the dip method if cracks are expected in close relationship to tight geometrical features such as pre-crack notch. Spot checking should have acceptable detection rates using bleed back technique.

- The NDT CoE recommends that if an actual aircraft component contains any geometric feature similar to the pre-crack notch, the dip method for penetrate application should not be utilized if cracks less than approximately 0.050" are expected.

Major Accomplishments

- All required project testing has been completed.
- Draft version of the final report is complete.
- Draft version of the final report is being reviewed by AMRDEC and then the NDT CoE.

Major Issues

- None

Hexavalent Chromium Free Coating Systems for Magnesium Transmission Housings on Aviation Systems Testing

Hexavalent Chromium Free Coating System for Magnesium Housings on Aviation Systems

Requirement/Impact Statement

- Qualification of a completely hexavalent chrome free coating system utilizing a chrome free primer and environmentally friendly conversion coatings and a completely chrome free pretreatment for all magnesium parts used in Army rotorcraft.
- The impact will be DOD wide on all Tagnite and Tagnite/ Rockhard coated magnesium parts used in Aviation.
- Exit criteria will be a Final Report detailing the performance of total hexavalent chromium free coating systems for use on aviation transmission housings.

Description

- If successful, the end product will be complete depot processing procedure for reworked magnesium parts utilizing completely hexavalent chrome free coating systems. This will leverage the work done under NDI Techniques over Tagnite and Rockhard and NDCEE Task 473-A2 Stripping of Tagnite Housings.

- The technical approach is to test hexavalent chrome free coating systems on magnesium and provide recommendations based on results.

- Funded under the SPOTA Program.

Status Assessment

- Schedule:
  - Testing was delayed due to length of time to award a coatings contract and to complete coatings work.
  - Anticipated end/transition date should be Dec 2011.
- Performance:
  - Wet tape test adhesion testing complete.
  - Outdoor exposure at beach and desert sites in progress.
  - Likelihood of success is good.

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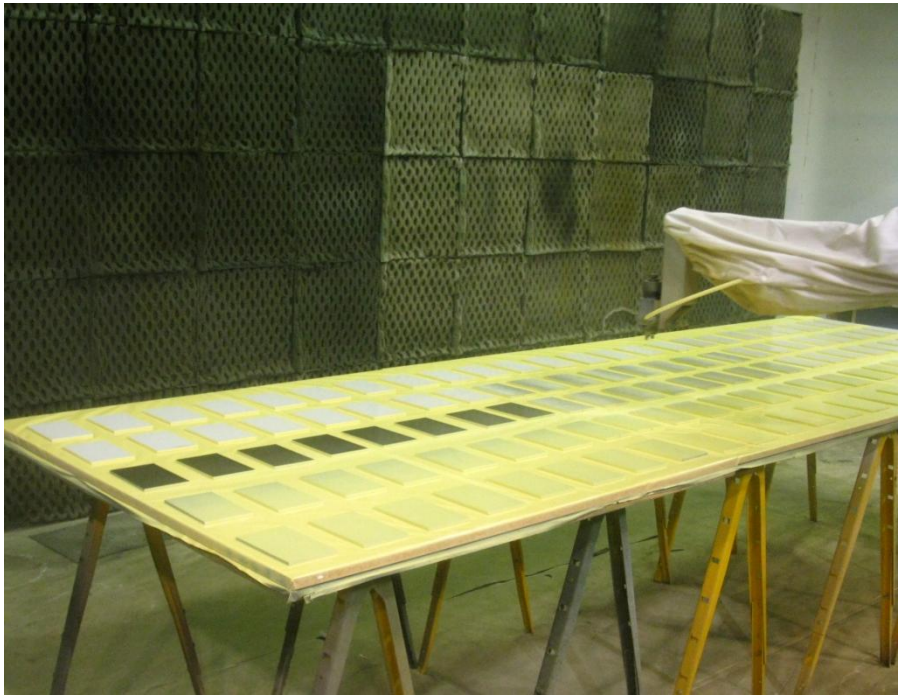
Completed coating 576 coupons with six different pretreatments, three different resin coatings, two different primers and a topcoat.

- ***Substrate***: ZE41A- T5 Magnesium
- ***Pretreatments***: Alodine 5700 and T5900 Immersion and Touch Up; Tagnite 8200 Type I and Brush Tagnite 12, Dow 7 Immersion and Dow 19 Touch Up Controls (chromated)
- ***Resins***: Low Temperature and High Temperature Rockhard, Touch Up Rockhard
- ***Primers***: MIL-PRF-23377 Type I Class N and C2
- ***Topcoat***: MIL-DTL-53039 Type I

Testing to be performed

- Wet Tape Test Adhesion per ASTM D 3359, Method A
- Pull-Off Adhesion per ASTM D 4541-95, Method E
- Neutral Salt Fog per ASTM B 117
  - Up to 2000 hours or until failure
- Accelerated Corrosion per GMW14872
  - 84 cycles or until failure
- SO2 Salt Fog per ASTM G 85 Annex 4
- Beach Exposure at Kennedy Space Center (KSC) Test Corrosion Site
- Desert Exposure in Arizona

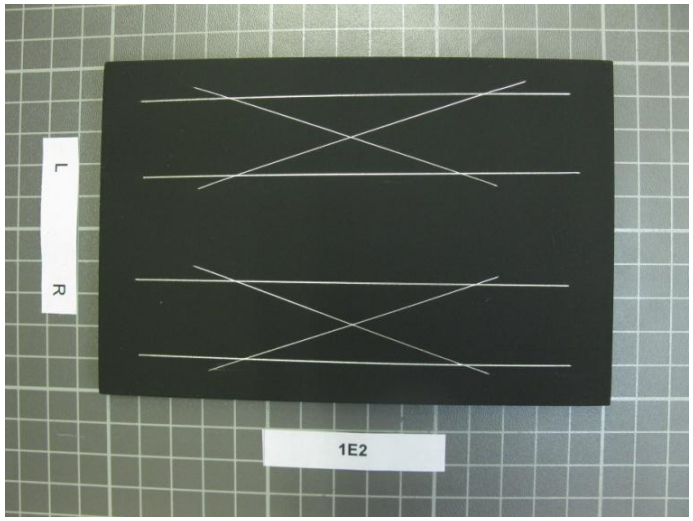
Hexavalent Chromium Free Coating System for Magnesium Housings on Aviation Systems



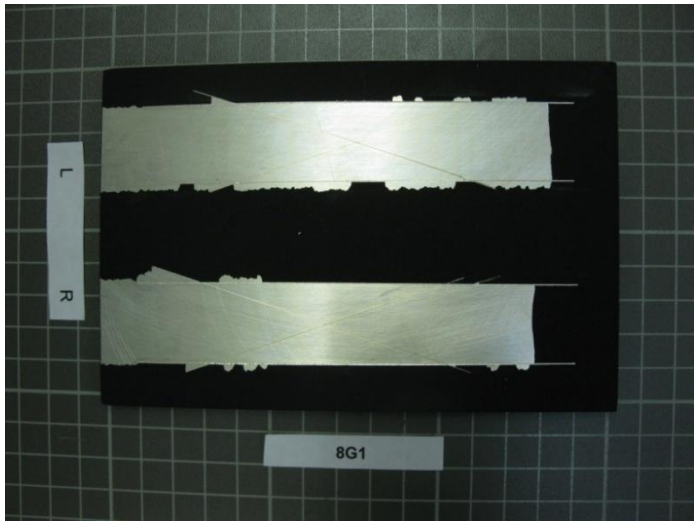
Computerized paint equipment at Concurrent Technologies Corporation applying chromated primer to coupons.

Wet Tape Test Adhesion

- Performed per ASTM D 3359, Standard Test Methods for Measuring Adhesion by Tape Test, Method A.
- Immersed panels in deionized water for 24 hours.
- Testing completed for all magnesium panels.



Dow 7 Control/LT Rockhard/23377N/53039 on Mg



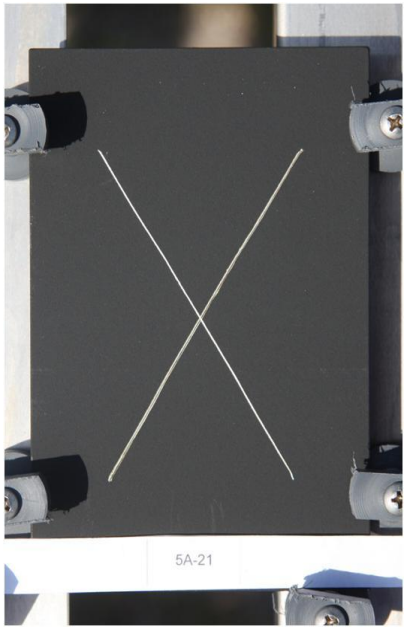
Alodine T 5900 Touch Up/Touch Up Rockhard/23377N/53039 on Mg

Wet Tape Test Adhesion

- **Preliminary analysis of results**
  - Alodine 5700 Immersion rated at 5A (best rating possible) for adhesion to all other magnesium coatings. This rating is equivalent to the Dow 7 Immersion Conversion Coating and the Tagnite Anodize controls.
  - Alodine 5700 Immersion performed better than the Alodine T 5900 Immersion.
  - Alodine 5700 and Alodine T 5900 Field Touch Up Wipe applications did not perform as well as the chromated Dow 19 Touch Up Wipe control.
  - For Dow 19 Touch Up Control, better adhesion with the MIL-PRF-23377 Class N primer than with Class C2.

Hexavalent Chromium Free Coating System for Magnesium Housings on Aviation Systems Beach Exposure

- First mounted on the exposure racks on May 13, 2010 and last evaluated August 13, 2010 at KSC.
- The specimens will be assessed per ASTM D1654.
- Quite a few magnesium specimens were already showing severe under-coating corrosion without much creep around the scribes after 3 months exposure as shown below.



Initial

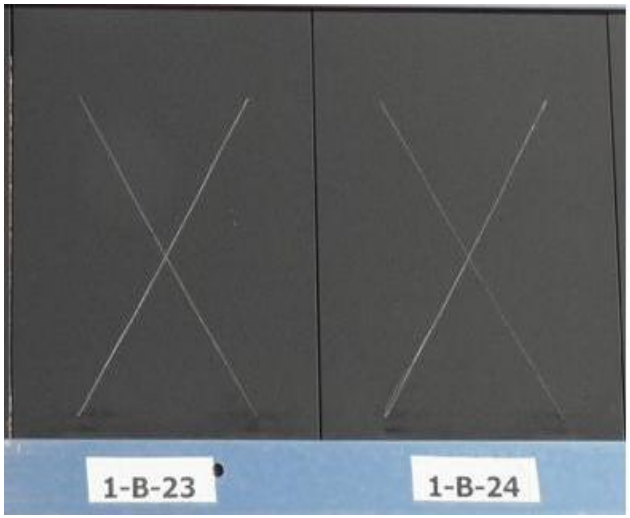
3 months

Alodine 5700/High Temp Rockhard / 23377C/53039 initially and at 3 months exposure

Hexavalent Chromium Free Coating System for Magnesium Housings on Aviation Systems Desert Exposure

- First mounted on the exposure racks on April 16, 2010 and last evaluated August 17, 2010 at Wittman, AZ.
- The specimens will be assessed per ASTM D1654.
- All magnesium specimens are generally in good condition as of August 2010.

1A=Dow 7/HT Rockhard/23377C/53039
4 months exposure



1B=Dow 7/HT Rockhard/23377N/53039
4 months exposure

Hexavalent Chromium Free Coating System for Magnesium Housings on Aviation Systems

Major Accomplishments

- Outdoor Exposure at Beach and Desert Environments ongoing and 3-4 month evaluations are in progress.
- Wet Tape Test Adhesion has been completed.
- Testing of Neutral Salt Fog and Accelerated Corrosion should begin in early October 2010.

Issues

- Delay in SO2 testing due to installation delays.

Demonstration of Hexavalent Chromium Free Coatings for Missile Weapon Systems

Demonstration of Hexavalent Chrome-Free Coatings for Missile Weapon Systems

Requirement/Impact Statement

- This project is intended to address the AERTA requirements PP-1-02-04 (SPOTA) and PP-2-02-03 (HMR) Surface Finishing Processes
- Memorandum for Secretaries of the Military Departments, Subject : Minimizing the Use of Hexavalent Chromium (Cr^{6+})
- Due to use of hex-chrome and high VOC's in current process, the impact is significant
- If successful, the exit criteria will include eliminating or reducing the use of DOD-P-15328 wash primer, chromated immersion Alodine ,and chromated sealer for Zinc Phosphate in the RESET of AMCOM items processed at LEAD

Description

- If successful, the end product of this program should include a qualified alternative to DOD-P-15328 wash primer, TCP treatment for Aluminum, a TCP based post treatment for Zinc Phosphate, as well a qualification for MIL-PRF-23377 primer on steel as part of a total hex chrome free system.

- The technical approach involves performance, materials compatibility, outdoor exposure testing, and a field demonstration.

- Funded under the SPOTA and Corrosion Programs.

Status Assessment

- Schedule
  - Delays due to contract issues, coating panels, and developing and executing a very comprehensive test plan
    Anticipated end/transition: FY12-13
- Performance
  - Test panels coated, stamped for identification
  - Wet Tape Test Adhesion completed
  - Beach, Desert, TA5 testing ongoing

Demonstration of Hexavalent Chrome-Free Coatings for Missile Weapon Systems

Objectives of program are to demonstrate the following for missile systems as part of a total hexavalent chromium free coating system:

- Evaluate missile primers with TCP on aluminum substrates
- Evaluate hexavalent chrome free alternatives to DOD-P-15328 wash primer for mixed metal assemblies
- Evaluate the performance of MIL-PRF-23377 class N primers applied over steel substrates treated with zinc phosphate and other pretreatments
- Evaluate the use of a hex chrome free sealer for post application sealing of zinc phosphate

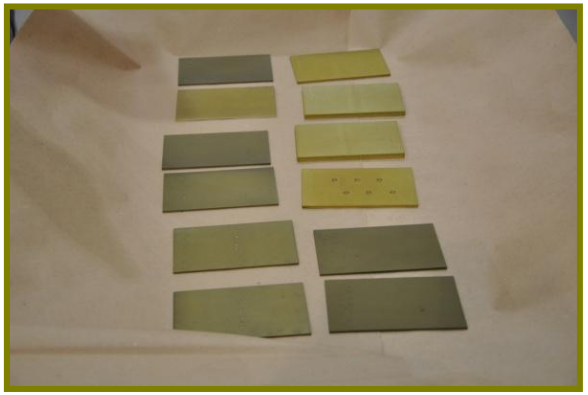
Demonstration of Hexavalent Chrome-Free Coatings for Missile Weapon Systems

Substrates	Pretreatments	Primers	Topcoats
AA-2024-T3	DOD-P-15328 (Wash Primer)	MIL-DTL-53030	MIL-DTL-53039, Type II, Silica Flattening Agents
AISI 4340	MIL-DTL-81706B, Type I, Class 1a (Alodine)	MIL-DTL-53030, Second Generation "Type II"	MIL-DTL-53039, Type II, Polymeric Flattening Agents
	MIL-DTL-81706B, Type II, Class 1a (TCP)	MIL-DTL-53022 Type I	MIL-DTL-64159, Type II, Polymeric Flattening Agents
	Spectrum Coatings EXGWP-508	MIL-PRF-23377 Type I, Class N (Non Chromate)	
	NAVAIR Chrome Free Process (CFP)	MIL-PRF-23377 Type I, Class C2 (Strontium Chromate)	
	TT -C-490, Type I, Zinc Phosphate with Cr^{6+} Sealer		
	TT -C-490, Type I, Zinc Phosphate with TCP Sealer		

Demonstration of Hexavalent Chrome-Free Coatings for Missile Weapon Systems

Requirement/Impact Statement

- This project is intended to reduce the use of hexavalent chromium and VOC emissions associated with the depot maintenance of AMCOM missile weapon systems at LEAD.
- The current usage of DOD-P-15328 at LEAD is a major contributor to their environmental cost burden because of its high hexavalent chromium and VOC content.

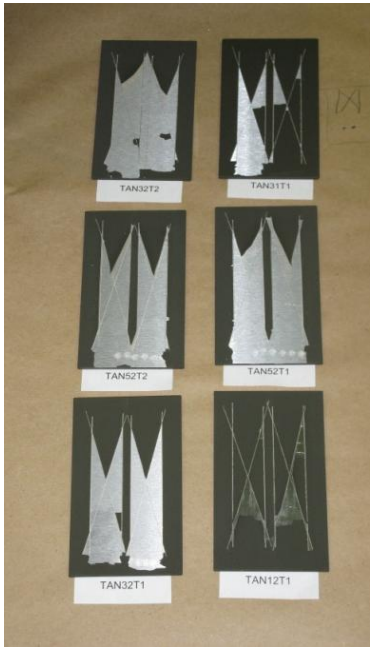


Testing to be performed

- Wet Tape Test Adhesion per ASTM D 3359, Method A
- Pull-Off Adhesion per ASTM D 4541-95, Method E
- Neutral Salt Fog per ASTM B 117
  - Up to 2000 hours or until failure
- Accelerated Corrosion per GMW14872
  - 84 cycles or until failure
- SO2 Salt Fog per ASTM G 85 Annex 4
- Beach and Desert Exposure
- Exposure at Redstone Arsenal, Static Test Stand to rocket motor exhaust
- Pretreatment Entrapment
- Pretreatment Process Time
- Recoat Assembly

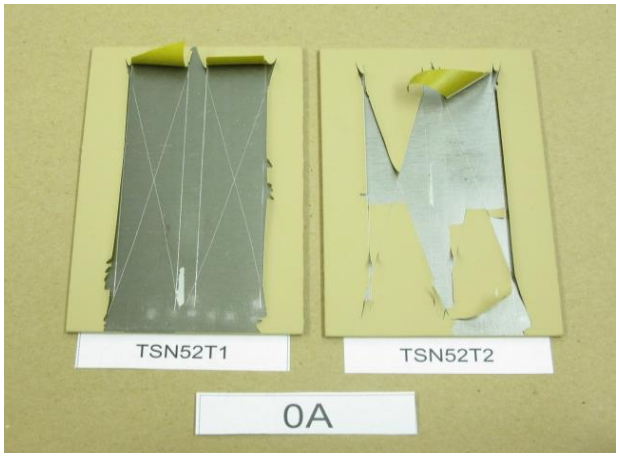
Wet Tape Test Adhesion

- Performed and evaluated per ASTM D 3359, Standard Test Methods for Measuring Adhesion by Tape Test, Method A.
- Immersed panels in deionized water for 24 hours.
- Testing completed for all steel and aluminum panels.



Aluminum, 0A
Predominantly Spectrum

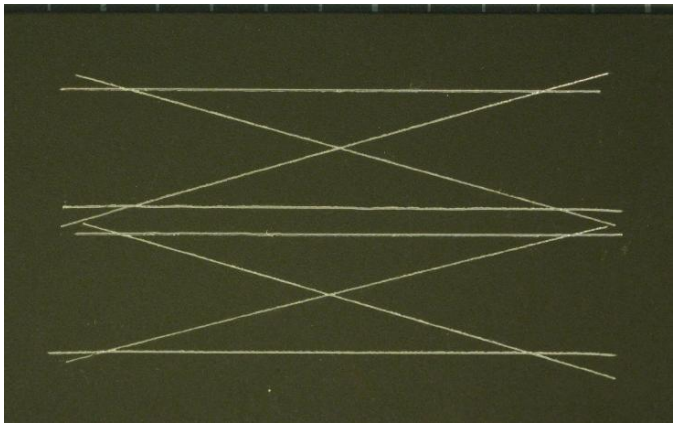
Aluminum, 4A
One Spectrum



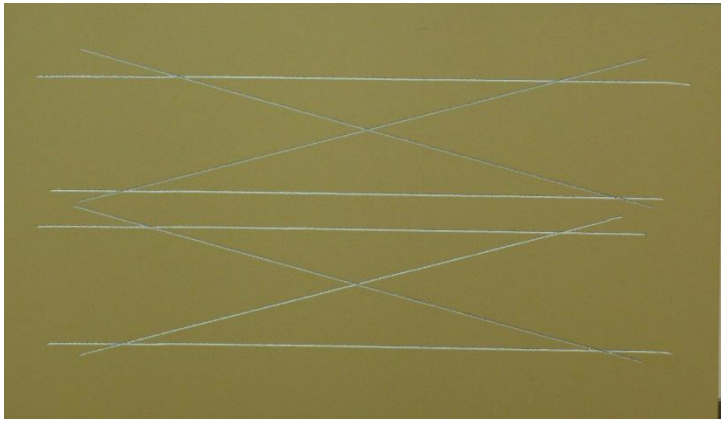
Steel, 0A
All Spectrum

Preliminary Wet Tape Test Adhesion Results

- Metalast TCP-HF-EPA and NAVAIR Chromium Free Process (CFP) pretreatments have shown promise with the MIL-DTL-53022 Type I primer and the MIL-DTL-53039 Type II (polymeric) topcoat on both aluminum and steel panels as compared with the DoD-P-15328 Wash Primer.



2024-T3
CFP
53022 Type I
53039 Type II



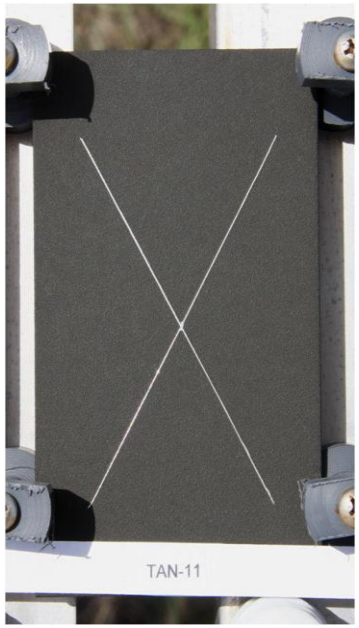
4340
TCP-HF-EPA
53022 Type1
53039 Type II

Demonstration of Hexavalent Chrome-Free Coatings for Missile Weapon Systems Beach Exposure

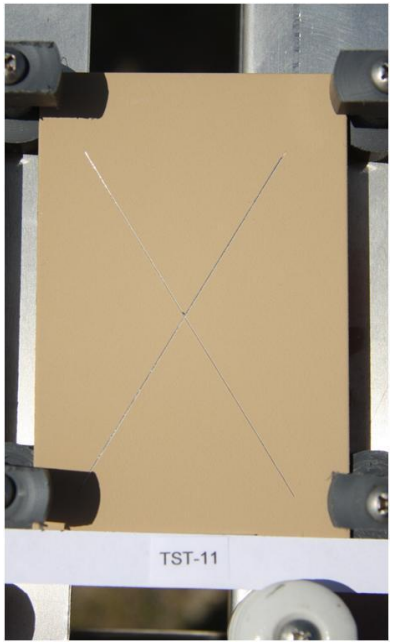
Kennedy Space Center (KSC) Beach Corrosion Site

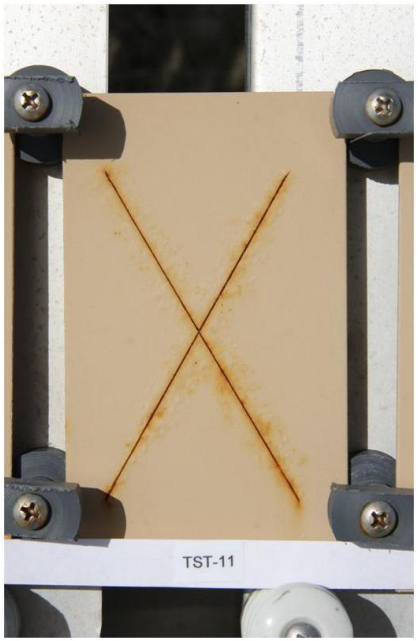
- Located approximately 1.5 miles south of Launch Complex 39A and situated approximately 150 feet from the mean high tide line.
- First mounted on the exposure racks on May 13th, 2010 and evaluated August 13th, 2010.
- The specimens will be assessed periodically per ASTM D1654.

Demonstration of Hexavalent Chrome-Free Coatings for Missile Weapon Systems
Beach Exposure



Aluminum





Steel

Typical results for coated aluminum and steel panels at KSC at 3 months.

Demonstration of Hexavalent Chrome-Free Coatings for Missile Weapon Systems
Desert Exposure

- First mounted on the exposure racks on April 16th, 2010 and last evaluated August 17th, 2010 in Wittmann, AZ.
- The specimens will be assessed periodically per ASTM D1654.
- Most specimens are generally in good condition as of August 2010.
- One case of coating delamination with the Spectrum EXGWP-508 is noted on the aluminum specimen below. The same coating system has not delaminated during beach exposure to date.

Aluminum panels pretreated with Spectrum EXGWP-508
4 Months Desert Exposure

RSA TA5 Outdoor Testing

- Exposure at Redstone Arsenal, AL; Static Test Area 5, Stand E.
- Three month evaluations were completed the first week of August 2010.
- Aluminum and steel specimens are generally in good condition as of August 2010 with no major differences.
- The specimens will be photographed approximately every 3 month and fully assessed per ASTM D1654 at the end of the 12 month exposure period.

Demonstration of Hexavalent Chrome-Free Coatings for Missile Weapon Systems

Major Accomplishments

- In excess of 1,600 test panels have been coated with various combinations of pretreatments, primers, and topcoats and coded.
  - AMRDEC is preparing to initiate ASTM B117 and GMW14872 corrosion, including galvanic corrosion testing early in October 2010.
- Test panels for beach, desert, and TA5 exposure have been placed in outdoor environments and 3-4 month evaluations are completed/in process.
- Wet Tape Test Adhesion on all panels has been completed and evaluations are in process.

Issues

- Sulfur dioxide corrosion chamber has been received but not installed.
- No galvanic testing scheduled for hex chrome free sealers for zinc phosphate treated steel panels.

POCs

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